National Institute of Environmental Health Sciences

Heat effects on mortality in 15 European cities

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Abstract:

Background: Epidemiologic studies show that high temperatures are related to mortality, but little is known about the exposure-response function and the lagged effect of heat. We report the associations between daily maximum apparent temperature and daily deaths during the warm season in 15 European cities. Methods: The city-specific analyses were based on generalized estimating equations and the city-specific results were combined in a Bayesian random effects meta-analysis. We specified distributed lag models in studying the delayed effect of exposure. Time-varying coefficient models were used to check the assumption of a constant heat effect over the warm season. Results: The city-specific exposure-response functions have a V shape, with a change-point that varied among cities. The meta-analytic estimate of the threshold was 29.4°C for Mediterranean cities and 23.3°C for north-continental cities. The estimated overall change in all natural mortality associated with a 1°C increase in maximum apparent temperature above the city-specific threshold was 3.12% (95% credibility interval Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.60% to 5.72%) in the Mediterranean region and 1.84% (0.06% to 3.64%) in the north-continental region. Stronger associations were found between heat and mortality from respiratory diseases, and with mortality in the elderly. Conclusions: There is an important mortality effect of heat across Europe. The effect is evident from June through August; it is limited to the first week following temperature excess, with evidence of mortality displacement. There is some suggestion of a higher effect of early season exposures. Acclimatization and individual susceptibility need further investigation as possible explanations for the observed heterogeneity among cities.

Source:
http://journals.lww.com/epidem/Fulltext/2008/09000/Heat_Effects_on_Mortality_in_15_European_Cities.13.aspx

Resource Description

Exposure : ☑

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

☑

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Greece;Spain;Hungary;Ireland;Finland;Slovenia;England;Italy;France;Czech Republic;Sweden;Switzerland

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Injury

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Elderly, Low Socioeconomic Status

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content